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**(54) INFORMATION PRESENTATION DEVICE**

INFORMATIONSPRÄSENTATIONSEINRICHTUNG  
DISPOSITIF DE PRESENTATION D'INFORMATION

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**US-A- 5 798 861** **US-A- 6 046 845**

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**Description****TECHNICAL FIELD:**

[0001] The present invention relates to an information presentation device according to the preamble of claim 1. The invention further relates to methods of mounting a display sheet to an information presentation device.

**BACKGROUND OF THE INVENTION:**

[0002] Various portable information presentation devices are known which include a display sheet wound onto a drum, the drum being journaled for rotation in an elongate housing. The housing is provided with a slot through which the display sheet passes. The display sheet can be unwound from the drum against the action of a biasing spring and maintained in an upright position to thereby display information printed on one side of the display sheet. One such information presentation device is disclosed in US-A-5 798 861.

[0003] A disadvantage with previously known devices is that, should it be desirable to change the information which is to be displayed, the device has to be disassembled, the original display sheet must be detached from the drum and a new sheet attached in its place. Often, the display sheet is adhered to the drum, thereby rendering the task of exchanging the display sheet more difficult. Due to the perceived awkwardness of this operation, it is not uncommon for a user simply to order a complete new device with preprinted information.

[0004] According to its abstract, US-A- 3 724 524 discloses a projection screen having a spring roller with a fabric-locking groove comprised of opposed side walls stepped on the roller periphery to the thickness of the fabric for producing safe mounting and flat hanging of picture surfaces, the side walls of which groove outwardly converge on a gap in the roller periphery of width equal to about twice the thickness of the screen fabric forming an inwardly-bent, wedging channel for locking on a metal strip clamped to the inner edge of the fabric screen. The metal strip and associated fabric is inserted into the groove in the longitudinal direction of the roller once an end cap of the roller has been removed.

**SUMMARY OF THE INVENTION:**

[0005] It is therefore an object of the present invention to provide an information presentation device in which exchange of the information which is to be presented is facilitated.

[0006] This object is achieved in accordance with the present invention by an information presentation device according to claim 1.

[0007] It is a further object of the present invention to provide a method of mounting a display sheet to an information presentation device, which method facilitates exchange of the display sheet.

[0008] This object is achieved in accordance with the present invention by a method of mounting a display sheet to an information presentation device, said device comprising:

an elongate housing having two opposed end walls and a first opening extending longitudinally between said end walls;

a spring-biased drum extending about a longitudinal axis and mounted for rotation in said housing between said end walls such that said longitudinal axis is substantially parallel to said first opening in said housing;

attachment means for attaching a display sheet to said drum such that said display sheet can be wound around said drum, said attachment means comprising:

an attachment strip attached to one end of said display sheet, and

receiving means on said drum for releasably engaging said attachment strip; said method comprising the steps of:

bringing said receiving means on said drum into alignment with an insertion opening in one of said end walls of said housing; inserting said attachment strip through said insertion opening in a direction substantially parallel to said longitudinal axis such that said attachment strip is brought into engagement with said receiving means on said drum;

winding said display sheet around said drum, and

tensioning said spring-biased drum such that said drum tends to retain said display sheet in said housing.

[0009] The above object is also attained in accordance with the present invention by a method of mounting a display sheet to an information presentation device, said device comprising:

an elongate housing having two opposed end walls and a first opening extending longitudinally between said end walls;

a pretensioned spring-biased drum extending about a longitudinal axis and mounted for rotation in said housing between said end walls such that said longitudinal axis is substantially parallel to said first opening in said housing;

attachment means for attaching a display sheet to said drum such that said display sheet can be wound around said drum, said attachment means comprising:

an attachment strip attached to one end of said

display sheet, and  
receiving means on said drum for releasably  
engaging said attachment strip; and

locking means for locking said pretensioned spring-biased drum such that said receiving means on said drum is aligned with an insertion opening in an end wall of said housing; said method comprising the steps of:

inserting said attachment strip through said insertion opening in a direction substantially parallel to said longitudinal axis such that said attachment strip is brought into engagement with said receiving means on said drum; and  
releasing said locking means such that said display sheet is caused to be wound around said drum.

[0010] The above object is further achieved by a method of mounting a display sheet to an information presentation device, said device comprising:

an elongate housing having two opposed end walls and a first opening extending longitudinally between said end walls;  
a spring-biased drum extending about a longitudinal axis and mounted for rotation in said housing between said end walls such that said longitudinal axis is substantially parallel to said first opening in said housing;  
attachment means for attaching a display sheet to said drum such that said display sheet can be wound around said drum, said attachment means comprising:

an attachment strip attached to one end of said display sheet, and  
receiving means on said drum for releasably engaging said attachment strip;

said method comprising the steps of:

bringing said receiving means on said drum into alignment with said first opening in said elongate housing;  
inserting said attachment strip through said elongate opening in a direction substantially perpendicular to said longitudinal axis such that said attachment strip is brought into engagement with said receiving means on said drum;  
winding said display sheet around said drum, and  
tensioning said spring-biased drum such that said drum tends to retain said display sheet in said housing.

[0011] The above object is also attained in accordance with the present invention by a method of mounting

a display sheet to an information presentation device, said device comprising:

an elongate housing having two opposed end walls and a first opening extending longitudinally between said end walls;

a pretensioned spring-biased drum extending about a longitudinal axis and mounted for rotation in said housing between said end walls such that said longitudinal axis is substantially parallel to said first opening in said housing;

attachment means for attaching a display sheet to said drum such that said display sheet can be wound around said drum, said attachment means comprising:

an attachment strip attached to one end of said display sheet, and  
receiving means on said drum for releasably engaging said attachment strip; and

locking means for locking said pretensioned spring-biased drum such that said receiving means on said drum is aligned with said first opening in said housing;

said method comprising the steps of:

inserting said attachment strip through said first opening in a direction substantially perpendicular to said longitudinal axis such that said attachment strip is brought into engagement with said receiving means on said drum; and  
releasing said locking means such that said display sheet is caused to be wound around said drum.

[0012] Since, in accordance with the present invention, the attachment strip to which a display sheet may be affixed can be inserted and removed from the information presentation device without the need to dismantle the device, one and the same information presentation device can effectively be used together with many different display sheets.

[0013] Preferred embodiments of the present invention are detailed in the dependent claims.

#### BRIEF DESCRIPTION OF THE DRAWINGS:

[0014] The present invention will be described in the following by way of example only and with reference to the attached drawings, in which:

Fig. 1 is a schematic perspective view of a first embodiment of an information presentation device according to the present invention viewed from behind;

Fig. 2 is a schematic end view of the device accord-

- ing to Fig. 1 equipped with a display sheet;
- Fig. 3 is a schematic end view of a drum forming part of the device according to Fig. 1;
- Fig. 4 is a schematic sectional plan view of the drum and end walls of the device according to Fig. 1;
- Fig. 5 is a schematic perspective view of a second embodiment of a drum for use in an information presentation device according to the present invention; and
- Fig. 6 is an end view on a larger scale of the drum illustrated in Fig. 5.

#### DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS:

[0015] In the drawings, reference numeral 10 generally denotes an information presentation device according to the present invention. The device 10 comprises an elongate housing 12 having two opposed end walls 14, 16 respectively. Preferably, the housing is rectangular and is fabricated from pressed sheet metal. A first opening 18 is provided in an upwardly facing wall 20 of the housing, the opening extending longitudinally between the two end walls 14, 16. The upwardly facing wall 20 is advantageously provided with a second opening 22 positioned centrally between the end walls 14, 16. As is most clearly shown in Fig. 2, the second opening 22 serves to accommodate an end of a preferably collapsible support rod 24. As will be apparent from the following description, the support rod 24 is adapted to support a display sheet 26 in an erect condition. A rear surface 28 of the housing may be equipped with support rod storage means 30, for example in the form of a pair of clips, so that the support rod 24, or at least its constituent components, can be stored and/or transported together with the housing when the information presentation device is not being used.

[0016] With particular reference to Figs. 2, 4, 5 and 6, the information presentation device 10 further comprises a drum 32 having an outer surface 33, the drum extending about a longitudinal axis 34. The drum 32 is mounted for rotation in the housing 10 between the two end walls 14, 16 such that the longitudinal axis 34 is substantially parallel to the first opening 18 in the housing. The drum 32 is intended to cooperate with the display sheet 26 such that the display sheet can be selectively wound onto and off the drum. To achieve this, the device according to the present invention further comprises attachment means, generally denoted 36 (see Fig. 3 and 6), for releasably attaching the display sheet 26 to the drum.

[0017] In accordance with the present invention, the attachment means 36 comprises an attachment strip 38 for attachment, for example using adhesive, to one end

of the display sheet, and receiving means 40 on the drum 32 for releasably engaging the attachment strip 38. In this manner, the attachment strip and receiving means form a releasable mechanical connection. Preferably, the attachment strip 38 and the receiving means 40 form a male/female joint in which the attachment strip comprises the male component of the joint. Thus, in one embodiment of the invention illustrated in Figs. 1 to 4, the receiving means 40 may be a longitudinally extending slot 42 having a tangential opening with a restriction to thereby delimit a chamber in the base of the slot. The slot 42 preferably extends the entire length of the drum 32. The chamber in the base of the slot is adapted to accommodate a bulbous lower portion 44 of the attachment strip 38 so that the attachment strip is constrained to rotate with the drum. As will be described below, the construction of the attachment means 36 permits the attachment strip 38 to be inserted in the longitudinal direction into the receiving means 40.

[0018] In a second embodiment of the invention illustrated in Figs. 5 and 6, the receiving means 40 is again a longitudinally extending slot 42. In this embodiment, the outer surface 33 of the drum 32 is provided with a recessed arcuate portion 84 which at least partially delimits one edge 86 of the slot 42. The attachment strip 38 is also provided with an arcuate portion 88 which, when the attachment strip is engaged in the longitudinally extending slot, overlies the recessed arcuate portion 84 of the outer surface of the drum. To ensure that the attachment strip 38 and the drum 32 will co-rotate, the attachment strip 38 further comprises a longitudinally extending shoulder 90. As is most clearly shown in Fig. 6, the shoulder 90 is adapted to abut the one edge 86 of the longitudinally extending slot 42 when the display sheet 26 is erected, i.e. when a force is applied to the display sheet in the direction of the arrow A. As will be described later, the construction of the attachment means 36 permits the attachment strip 38 to be inserted in a direction perpendicular to the longitudinal axis of the drum 32 into the receiving means 40.

[0019] In terms of the first embodiment, and as is most clearly illustrated in Figs. 1 and 2, at least one end wall 14 of the housing 12 has an insertion opening 46 extending from an end of the first opening 18 in the housing. The insertion opening 46 is in the form of a slot and is arranged with respect to the drum 32 such that the attachment strip 38 can be brought into engagement with the receiving means 40 on the drum by inserting the attachment strip through the insertion opening 46 in a direction substantially parallel to the longitudinal axis 34 of the drum. In this manner, any display sheet which is mounted to an attachment strip 38 can be easily connected to the information presentation device without having to dismantle the device.

[0020] In terms of the second embodiment, the first opening 18 in the housing 12 is arranged with respect to the drum 32 such that the longitudinally extending slot 42 in the drum 32 can be positioned adjacent the first

opening 18 seen in the radial direction to thereby allow the attachment strip 36 to be inserted into the slot 42 in a direction perpendicular to the longitudinal axis 34 of the drum.

[0021] For both embodiments, the drum 32 is preferably spring-biased such that when a display sheet is attached to the drum, the display sheet is drawn into the housing. In a manner known per se, and as is illustrated in Fig. 4, the drum is hollow 32 and accommodates a biasing spring 48 mounted around a spindle 50 of the drum. The spindle is arranged for relative axial displacement with respect to the drum 32 against the action of the biasing spring. In a preferred embodiment of the invention, the spring biasing is adjustable by means of a tensioning device 52 accessible from outside the housing. The tensioning device 52 may comprise a slot 54 in one end of the spindle 50. Adjacent the end of the spindle there is provided a transversely extending engagement pin 56. The engagement pin 56 is arranged to cooperate with a ratchet arrangement 58 mounted on the end wall 16 concentrically with the spindle 50. The ratchet arrangement 58 has a centrally positioned through bore which is aligned with an opening 60 in the end wall 16. When the engagement pin 56 is in cooperation with the ratchet arrangement, the end of the spindle comprising the slot 54 lies immediately adjacent the opening 60 in the end wall. The ratchet arrangement 58 prevents the spindle 50 from rotating under the influence of the spring biasing with respect to the drum 32. In order to alter the tension in the biasing spring 48, a bladed instrument may be inserted through the opening 60 in the end wall 16 to engage the slot 54 in the spindle 50. The spindle may then be displaced inwards, i.e. to the right as shown in Fig. 4 to bring the engagement pin 56 out of engagement with the ratchet arrangement 58. The spindle may then be rotated with respect to the drum in order to alter the tension in the biasing spring. Once the desired tension is achieved, the bladed instrument may be withdrawn from the slot 54 to allow the engagement pin 56 to reengage the ratchet arrangement.

[0022] In order to be able to insert or remove an information sheet, it is necessary that the receiving means 40 on the drum 32 be aligned with either the insertion opening 46 in the housing (Figs. 1 to 4) or the first opening 18 in the housing (Figs. 5 and 6). To facilitate the alignment operation, in a preferred embodiment of the invention the drum 32 is provided with positioning means 62, the positioning means being accessible from outside the housing. Possible positioning means 62 are illustrated in Fig. 4. It is to be understood that identical positioning means may also be employed in the embodiment illustrated in Figs. 5 and 6. Thus, the positioning means may comprise an end plate 64 fixedly mounted to the drum 32 and constrained to rotate therewith. The end plate 64 displays an annular recess 66 located concentrically with the longitudinal axis 34 of the drum 32. The annular recess 66 comprises an inner facing surface which acts as a bearing surface for the drum and

cooperates with a cylindrical support member 68 affixed to the end wall 14 of the housing. The cylindrical support member 68 is aligned with a positioning opening 70 in the end wall 14. The annular recess 66 further comprises a base section 72 provided with a slot 74. By inserting a bladed instrument through the positioning opening 70 in the end wall 14 so that the instrument engages the slot 74, the angular position of the drum 32 can be adjusted.

[0023] In certain circumstances, for example if the information presentation device is delivered with the biasing spring 48 in a pretensioned condition, it is necessary to be able to lock the drum 32 in a position at which the receiving means 40 on the drum 32 is aligned with either the insertion opening 46 or the first opening 18 in the housing. To this effect, the end wall 14 of the housing may be provided with a locking opening 76 through which locking means in the form of e.g. a locking pin 78 may be inserted. The locking pin 78 is intended to engage a (not shown) recess or opening in the end plate 64 on the drum 32. In this manner, the locking means is accessible from outside the housing to effect locking of the drum when a display sheet is e.g. substantially fully unwound from the drum.

[0024] In order to ensure stability of the information display device, particularly when the display sheet is erect, the housing 12 may be provided with support means 80, for example in the form of two pairs of outwardly pivotable feet (Fig. 2).

[0025] The information display device 10 according to the present invention may be delivered to the consumer either with the biasing spring 48 in a pretensioned or non-tensioned condition. In the following, methods of mounting a display sheet to both embodiment of the device will be described for these two conditions.

[0026] For the embodiment illustrated in Figs. 1 to 4, when the information display device is delivered with the biasing spring in a non-tensioned condition, a display sheet 26 may be mounted to the device by firstly bringing the receiving means 40 on the drum 32 into alignment with the insertion opening 46 in the end wall 14 of the housing. As has been explained above, this can be suitably attained by rotating the drum 32 via the positioning means 62. Thereafter, the attachment strip 38 to which the display sheet 26 is affixed is inserted through the insertion opening 46 in a direction substantially parallel to the longitudinal axis 34 of the drum 32 such that said attachment strip is brought into engagement with the receiving means 40 on the drum. The display sheet is then wound around the drum 32, suitably by means of the positioning means 62. Finally, the biasing spring 48 is tensioned by means of the tensioning device 52 so that the drum tends to retain the display sheet in the housing 12.

[0027] When the information display device is delivered with the biasing spring in a tensioned condition, the receiving means 40 on the drum is already predisposed in alignment with the insertion opening 46 in the end wall

by means of the locking means 78. A display sheet 26 may be mounted to the device by inserting the attachment strip 38 through the insertion opening 46 in a direction substantially parallel to the longitudinal axis 34 of the drum 32 such that the attachment strip is brought into engagement with the receiving means 40 on the drum. The locking pin 78 is then removed such that the display sheet 26 is caused to be wound around the drum as a result of the spring biasing of the drum.

[0028] In terms of the embodiment illustrated in Figs. 5 and 6, when the information display device is delivered with the biasing spring in a non-tensioned condition, a display sheet 26 may be mounted to the device by firstly bringing the receiving means 40 on the drum 32 into alignment with the first opening 18 in the housing 18. As has been explained above, this can be suitably attained by rotating the drum 32 via the positioning means 62. Thereafter, the attachment strip 38 to which the display sheet 26 is affixed is inserted through the first opening 18 in a direction substantially perpendicular to the longitudinal axis 34 of the drum 32 such that said attachment strip is brought into engagement with the receiving means 40 on the drum. The display sheet is then wound around the drum 32, suitably by means of the positioning means 62. Finally, the biasing spring 48 is tensioned by means of the tensioning device 52 so that the drum tends to retain the display sheet in the housing 12.

[0029] When the information display device is delivered with the biasing spring in a tensioned condition, the receiving means 40 on the drum is already predisposed in alignment with the first opening 18 in the housing by means of the locking means 78. A display sheet 26 may be mounted to the device by inserting the attachment strip 38 through the first opening 18 in a direction substantially perpendicular to the longitudinal axis 34 of the drum 32 such that the attachment strip is brought into engagement with the receiving means 40 on the drum. The locking pin 78 is then removed such that the display sheet 26 is caused to be wound around the drum as a result of the spring biasing of the drum.

[0030] As is best shown in Fig. 2, the display sheet 26 is preferably provided with an upper support strip 80. When the display sheet is wound on the drum 32, the upper support strip 80 lies over the first opening 18 in the upwardly facing wall 20 of the housing. To facilitate raising of the display sheet, the upwardly facing wall 20 of the housing may be provided with a recess 82 adjacent the first opening 18. In this manner, a user may more easily grasp the upper support strip 80 by inserting his/her fingers into the recess 82. To erect the display sheet, the support rod 24 is assembled and inserted into the second opening 22 in the upwardly facing wall of the housing. The upper support strip 80 is grasped and drawn upwardly, thereby causing the drum 32 to rotate against the action of the biasing spring. The upper support strip is hooked over the remote end of the support rod to thereby maintain the display sheet in an erect condition.

[0031] To collapse the display sheet 26, the upper support strip 80 is lifted from the support rod 24 and, under the action of the spring biasing, the drum 32 rotates to draw the display sheet into the housing.

[0032] It is to be understood that the invention has been described above by way of example only and that various modifications and alternative embodiments within the scope of the appended claims will be apparent to the skilled person. For example, the support rod 24 may be integrated with the housing 12.

## Claims

1. An information presentation device (10) comprising:

an elongate housing (12) having two opposed end walls (14,16) and a first opening (18) extending longitudinally between said end walls; a drum (32) having an outer surface (33), said drum extending about a longitudinal axis (34) and mounted for rotation in said housing between said end walls (14,16) such that said longitudinal axis is substantially parallel to said first opening (18) in said housing; and attachment means (36) for attaching a display sheet (26) to said drum (32) such that said display sheet can be wound around said drum, said attachment means (36) comprising:

an attachment strip (38) for attachment to one end of said display sheet, and receiving means (40) on said drum for releasably engaging said attachment strip;

said attachment strip (38) and said receiving means (40) forming a releasable mechanical connection;

**characterized in that** said attachment means (36) is configured such that said releasable mechanical connection is releasable while said drum (32) is within said elongate housing (12).

2. The information presentation device (10) as claimed in claim 1, **characterized in that** releasable mechanical connection is a male/female joint in which said attachment strip (38) comprises the male component of the joint.
3. The information presentation device (10) as claimed in claim 2, **characterized in that** said receiving means (40) on said drum (32) is a longitudinally extending slot.
4. The information presentation device (10) as claimed in any one of the preceding claims, **char-**

acterized in that at least one of said end walls (14,16) of said housing has an insertion opening (46) extending from an end of said first opening (18), said insertion opening being arranged with respect to said drum (32) such that said attachment strip (38) can be brought into engagement with said receiving means (40) on said drum by inserting said attachment strip through said insertion opening (18) in a direction substantially parallel to said longitudinal axis (34).

5. The information presentation device (10) as claimed in claim 3, **characterized in that** said outer surface (33) of said drum comprises a recessed arcuate portion (84) at least partially delimiting one edge (86) of said longitudinally extending slot in said drum (32), and in that said attachment strip (38) has an arcuate portion (88) which, when said attachment strip is engaged in said longitudinally extending slot, overlies said recessed arcuate portion (84).

6. The information presentation device (10) as claimed in claim 5, **characterized in that** said attachment strip (38) comprises a longitudinally extending shoulder (90), said shoulder being adapted to abut said one edge (86) of said longitudinally extending slot in said drum (32) when said display sheet (26) is erected.

7. The information presentation device (10) as claimed in any one of the preceding claims, **characterized in that** said drum (32) is spring-biased such that when a display sheet (26) is attached to said drum, said display sheet is drawn into said housing (12), said spring biasing being adjustable by means of a tensioning device (52) accessible from outside the housing.

8. The information presentation device (10) as claimed in any one of the preceding claims, **characterized in that** said drum (32) is provided with positioning means (62), said positioning means being accessible from outside the housing to effect alignment of the receiving means (40) on said drum (32) with either said first opening (18) or said insertion opening (46).

9. The information presentation device (10) as claimed in any one of the preceding claims, **characterized in that** said drum is provided with locking means (78) accessible from outside the housing to effect locking of the drum when a display sheet is substantially fully unwound from said drum (32).

10. A method of mounting a display sheet (26) to an information presentation device (10), said device comprising:

an elongate housing (12) having two opposed end walls (14,16) and a first opening (18) extending longitudinally between said end walls; a spring-biased drum (32) extending about a longitudinal axis (34) and mounted for rotation in said housing between said end walls such that said longitudinal axis is substantially parallel to said first opening (18) in said housing; attachment means (36) for attaching a display sheet to said drum (32) such that said display sheet can be wound around said drum, said attachment means comprising:

an attachment strip (38) attached to one end of said display sheet, and  
receiving means (40) on said drum for releasably engaging said attachment strip;

said method comprising the steps of:

bringing said receiving means (40) on said drum into alignment with an insertion opening (46) in one of said end walls of said housing; inserting said attachment strip (38) through said insertion opening in a direction substantially parallel to said longitudinal axis (34) such that said attachment strip is brought into engagement with said receiving means (40) on said drum;  
winding said display sheet around said drum, and  
tensioning said spring-biased drum (32) such that said drum tends to retain said display sheet in said housing (12).

11. A method of mounting a display sheet (26) to an information presentation device (10), said device comprising:

an elongate housing (12) having two opposed end walls (14,16) and a first opening (18) extending longitudinally between said end walls; a pretensioned spring-biased drum (32) extending about a longitudinal axis (34) and mounted for rotation in said housing between said end walls such that said longitudinal axis is substantially parallel to said first opening (18) in said housing; attachment means (36) for attaching a display sheet (26) to said drum (32) such that said display sheet can be wound around said drum, said attachment means comprising:

an attachment strip (38) attached to one end of said display sheet, and  
receiving means (40) on said drum for releasably engaging said attachment strip;  
and

locking means (78) for locking said pretensioned spring-biased drum (32) such that said receiving means (40) on said drum (32) is aligned with an insertion opening (46) in an end wall (14) of said housing;

said method comprising the steps of:

inserting said attachment strip (38) through said insertion opening (46) in a direction substantially parallel to said longitudinal axis (34) such that said attachment strip (38) is brought into engagement with said receiving means (40) on said drum; and  
releasing said locking means (78) such that said display sheet is caused to be wound around said drum (32).

12. A method of mounting a display sheet (26) to an information presentation device (10), said device comprising:

an elongate housing (12) having two opposed end walls (14,16) and a first opening (18) extending longitudinally between said end walls; a spring-biased drum (32) extending about a longitudinal axis (34) and mounted for rotation in said housing between said end walls such that said longitudinal axis is substantially parallel to said first opening (18) in said housing; attachment means (36) for attaching a display sheet to said drum (32) such that said display sheet can be wound around said drum, said attachment means comprising:

an attachment strip (38) attached to one end of said display sheet, and  
receiving means (40) on said drum for releasably engaging said attachment strip;

said method comprising the steps of:

bringing said receiving means (40) on said drum into alignment with said first opening (18) in said elongate housing (12);  
inserting said attachment strip (38) through said elongate opening in a direction substantially perpendicular to said longitudinal axis (34) such that said attachment strip is brought into engagement with said receiving means (40) on said drum;  
winding said display sheet around said drum, and  
tensioning said spring-biased drum (32) such that said drum tends to retain said display sheet in said housing (12).

13. A method of mounting a display sheet (26) to an

information presentation device (10), said device comprising:

an elongate housing (12) having two opposed end walls (14,16) and a first opening (18) extending longitudinally between said end walls; a pretensioned spring-biased drum (32) extending about a longitudinal axis (34) and mounted for rotation in said housing between said end walls such that said longitudinal axis is substantially parallel to said first opening (18) in said housing;  
attachment means (36) for attaching a display sheet (26) to said drum (32) such that said display sheet can be wound around said drum, said attachment means comprising:

an attachment strip (38) attached to one end of said display sheet, and  
receiving means (40) on said drum for releasably engaging said attachment strip; and

locking means (78) for locking said pretensioned spring-biased drum (32) such that said receiving means (40) on said drum (32) is aligned with said first opening (18) in said housing;

said method comprising the steps of:

inserting said attachment strip (38) through said first opening (18) in a direction substantially perpendicular to said longitudinal axis (34) such that said attachment strip (38) is brought into engagement with said receiving means (40) on said drum; and  
releasing said locking means (78) such that said display sheet is caused to be wound around said drum (32).

## Patentansprüche

1. Informationspräsentationseinrichtung (10) umfassend:

ein längliches Gehäuse (12) mit zwei gegenüberliegenden Abschlusswänden (14, 16) und einer ersten Öffnung (18), die sich der Länge nach zwischen den Abschlusswänden erstreckt;

eine Trommel (32) mit einer äußeren Oberfläche (33), wobei die Trommel um eine Längsachse (34) ausgebildet ist und zur Rotation in dem Gehäuse zwischen den Abschlusswänden (14, 16) befestigt ist derart, dass die Längsachse im Wesentlichen parallel zur ersten Öff-



nung (18) im Gehäuse verläuft; und Befestigungsmittel (36) für die Anbringung eines Schaublattes (26) an der Trommel (32) derart, dass das Schaublatt um die Trommel gewickelt werden kann, wobei die Befestigungsmittel umfassen:

eine Befestigungsleiste (38) zur Anbringung an einem Ende des Schaublattes, und  
ein Aufnahmemittel (40) an der Trommel für die lösbare Anbringung der Befestigungsleiste;

wobei die Befestigungsleiste (38) und das Aufnahmemittel (40) eine lösbare mechanische Verbindung bilden;

**dadurch gekennzeichnet, dass** die Befestigungsmittel (36) derart ausgebildet sind, dass die lösbare mechanische Verbindung lösbar ist während die Trommel (32) in dem länglichen Gehäuse (12) angeordnet ist.

2. Informationspräsentationseinrichtung (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** die lösbare mechanische Verbindung eine männliche/weibliche Verbindung ist, bei der die Befestigungsleiste (38) die männliche Komponente der Verbindung umfasst.
3. Informationspräsentationseinrichtung (10) nach Anspruch 2, **dadurch gekennzeichnet, dass** das Aufnahmemittel (40) an der Trommel (32) eine sich der Länge nach erstreckende Nut ist.
4. Informationspräsentationseinrichtung (10) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** wenigstens eine der Abschlusswände (14, 16) des Gehäuses eine Einschuböffnung (46) aufweist, die von einem Ende der ersten Öffnung (18) ausgeht, wobei die Einschuböffnung derart bezüglich der Trommel (32) angeordnet ist, dass die Befestigungsleiste (38) in Eingriff mit dem Aufnahmemittel (40) an der Trommel gebracht werden kann durch Einschieben der Befestigungsleiste durch die Einschuböffnung (18) in einer Richtung, die im Wesentlichen parallel zur Längsachse (34) verläuft.
5. Informationspräsentationseinrichtung (10) nach Anspruch 3, **dadurch gekennzeichnet, dass** die äußere Oberfläche (33) der Trommel einen vertieften, gebogenen bzw. bogenförmigen Teilbereich (84) umfasst, der einen Rand (86) der sich der Länge nach erstreckenden Nut in der Trommel (32) zumindest teilweise begrenzt, und dass die Befestigungsleiste (38) einen gebogenen bzw. bogenförmigen Teilbereich (88) aufweist, der, wenn die Be-

festigungsleiste in die sich der Länge nach erstreckende Nut eingreift, auf dem vertieften, gebogenen bzw. bogenförmigen Teilbereich (84) aufliegt.

6. Informationspräsentationseinrichtung (10) nach Anspruch 5, **dadurch gekennzeichnet, dass** die Befestigungsleiste (38) eine sich der Länge nach erstreckende Schulter (90) umfasst, wobei die Schulter derart ausgebildet ist, dass sie an dem Rand (86) der sich der Länge nach erstreckenden Nut in der Trommel (32) anliegt, wenn das Schaublatt (26) aufgerichtet ist.
7. Informationspräsentationseinrichtung (10) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Trommel (32) federgespannt oder federspannbar ist derart, dass dann, wenn das Schaublatt (26) an der Trommel angebracht ist, das Schaublatt in das Gehäuse (12) gezogen wird, wobei die Federspannung einstellbar ist durch eine Spanneinheit (52), die von außerhalb des Gehäuses zugänglich ist.
8. Informationspräsentationseinrichtung (10) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Trommel (32) mit Positionierungsmitteln (62) versehen ist, wobei die Positionierungsmittel von außerhalb des Gehäuses zugänglich sind, um die Ausrichtung des Aufnahmemittels (40) der Trommel (32) entweder an der ersten Öffnung (18) oder an der Einschuböffnung (46) herbeizuführen.
9. Informationspräsentationseinrichtung (10) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Trommel mit Sicherungsmitteln (78) versehen ist, die von außerhalb des Gehäuses zugänglich sind, um eine Sicherung der Trommel herbeizuführen, wenn das Schaublatt im Wesentlichen vollständig von der Trommel (32) abgewickelt ist.
10. Verfahren zur Anbringung eines Schaublattes (26) an einer Informationspräsentationseinrichtung (10), wobei die Informationspräsentationseinrichtung umfasst:

ein längliches Gehäuse (12) mit zwei gegenüberliegenden Abschlusswänden (14, 16) und einer ersten Öffnung (18), die sich der Länge nach zwischen den Abschlusswänden erstreckt;  
eine federgespannte oder federspannbare Trommel (32), die um eine Längsachse (34) ausgebildet ist und zur Rotation in dem Gehäuse zwischen den Abschlusswänden befestigt ist derart, dass die Längsachse im Wesentlichen parallel zur ersten Öffnung (18) im Ge-

häuse verläuft;

Befestigungsmittel (36) für die Anbringung eines Schaublattes an der Trommel (32) derart, dass das Schaublatt um die Trommel gewickelt werden kann, wobei die Befestigungsmittel umfassen:

eine Befestigungsleiste (38), die an einem Ende des Schaublattes angebracht ist, und ein Aufnahmemittel (40) an der Trommel für die lösbare Anbringung der Befestigungsleiste;

wobei das Verfahren folgende Schritte umfasst:

Ausrichtung des Aufnahmemittels (40) der Trommel an einer Einschuböffnung (46) in einer der Abschlusswände des Gehäuses;  
Einschieben der Befestigungsleiste (38) durch die Einschuböffnung in einer Richtung, die im Wesentlichen parallel zu der Längsachse (34) verläuft, derart, dass die Befestigungsleiste in Eingriff mit dem Aufnahmemittel (40) an der Trommel gebracht wird;  
Aufwickeln des Schaublattes um die Trommel, und  
Spannen der federgespannten oder federspannbaren Trommel (32) derart, dass die Trommel das Bestreben hat, das Schaublatt in dem Gehäuse (12) zurückzuhalten.

11. Verfahren zur Anbringung eines Schaublattes (26) an einer Informationspräsentationseinrichtung (10), wobei die Informationspräsentationseinrichtung umfasst:

ein längliches Gehäuse (12) mit zwei gegenüberliegenden Abschlusswänden (14, 16) und einer ersten Öffnung (18), die sich der Länge nach zwischen den Abschlusswänden erstreckt;  
eine vorgespannte federspannbare Trommel (32), die um eine Längsachse (34) ausgebildet ist und zur Rotation in dem Gehäuse zwischen den Abschlusswänden befestigt ist derart, dass die Längsachse im Wesentlichen parallel zur ersten Öffnung (18) im Gehäuse verläuft;  
Befestigungsmittel (36) für die Anbringung eines Schaublattes (26) an der Trommel (32) derart, dass das Schaublatt um die Trommel gewickelt werden kann, wobei die Befestigungsmittel umfassen:

eine Befestigungsleiste (38), die an einem Ende des Schaublattes angebracht ist, und ein Aufnahmemittel (40) an der Trommel für die lösbare Anbringung der Befestigungsleiste;

und

Sicherungsmittel (78) für die Sicherung der vorgespannten federspannbaren Trommel (32) derart, dass das Aufnahmemittel (40) der Trommel (32) an einer Einschuböffnung (46) in einer Abschlusswand (14) des Gehäuses ausgerichtet ist;

wobei das Verfahren folgende Schritte umfasst:

Einschieben der Befestigungsleiste (38) durch die Einschuböffnung (46) in einer Richtung, die im Wesentlichen parallel zu der Längsachse (34) verläuft, derart, dass die Befestigungsleiste (38) in Eingriff mit dem Aufnahmemittel (40) an der Trommel gebracht wird; und  
Lösen der Sicherungsmittel (78), so dass das Schaublatt um die Trommel (32) gewickelt wird.

12. Verfahren zur Anbringung eines Schaublattes (26) an einer Informationspräsentationseinrichtung (10), wobei die Informationspräsentationseinrichtung umfasst:

ein längliches Gehäuse (12) mit zwei gegenüberliegenden Abschlusswänden (14, 16) und einer ersten Öffnung (18), die sich der Länge nach zwischen den Abschlusswänden erstreckt;  
eine federgespannte oder federspannbare Trommel (32), die um eine Längsachse (34) ausgebildet ist und zur Rotation in dem Gehäuse zwischen den Abschlusswänden befestigt ist derart, dass die Längsachse im Wesentlichen parallel zur ersten Öffnung (18) im Gehäuse verläuft;  
Befestigungsmittel (36) für die Anbringung eines Schaublattes an der Trommel (32) derart, dass das Schaublatt um die Trommel gewickelt werden kann, wobei die Befestigungsmittel umfassen:

eine Befestigungsleiste (38), die an einem Ende des Schaublattes angebracht ist, und ein Aufnahmemittel (40) an der Trommel für die lösbare Anbringung der Befestigungsleiste;

wobei das Verfahren folgende Schritte umfasst:

Ausrichtung des Aufnahmemittels (40) der Trommel an der ersten Öffnung (18) in dem länglichen Gehäuse (12);  
Einschieben der Befestigungsleiste (38) durch die genannte längliche Öffnung in einer Richtung, die im Wesentlichen senkrecht zu der Längsachse (34) verläuft, derart, dass die Be-

festigungsleiste in Eingriff mit dem Aufnahmemittel (40) an der Trommel gebracht wird; Aufwickeln des Schaublattes um die Trommel, und Spannen der federgespannten oder federspannbaren Trommel (32) derart, dass die Trommel das Bestreben hat, das Schaublatt in dem Gehäuse (12) zurückzuhalten.

13. Verfahren zur Anbringung eines Schaublattes (26) an einer Informationspräsentationseinrichtung (10), wobei die Informationspräsentationseinrichtung umfasst:

ein längliches Gehäuse (12) mit zwei gegenüberliegenden Abschlusswänden (14, 16) und einer ersten Öffnung (18), die sich der Länge nach zwischen den Abschlusswänden erstreckt;

eine vorgespannte federspannbare Trommel (32), die um eine Längsachse (34) ausgebildet ist und zur Rotation in dem Gehäuse zwischen den Abschlusswänden befestigt ist derart, dass die Längsachse im Wesentlichen parallel zur ersten Öffnung (18) im Gehäuse verläuft; Befestigungsmittel (36) für die Anbringung eines Schaublattes (26) an der Trommel (32) derart, dass das Schaublatt um die Trommel gewickelt werden kann, wobei die Befestigungsmittel umfassen:

eine Befestigungsleiste (38), die an einem Ende des Schaublattes angebracht ist, und ein Aufnahmemittel (40) an der Trommel für die lösbare Anbringung der Befestigungsleiste;

und

Sicherungsmittel (78) für die Sicherung der vorgespannten federspannbaren Trommel (32) derart, dass das Aufnahmemittel (40) der Trommel (32) an der ersten Öffnung (18) des Gehäuses ausgerichtet ist;

wobei das Verfahren folgende Schritte umfasst:

Einschieben der Befestigungsleiste (38) durch die erste Öffnung (18) in einer Richtung, die im Wesentlichen senkrecht zu der Längsachse (34) verläuft, derart, dass die Befestigungsleiste in Eingriff mit dem Aufnahmemittel (40) an der Trommel gebracht wird; und Lösen der Sicherungsmittel (78), so dass das Schaublatt um die Trommel (32) gewickelt wird.

## Revendications

1. Dispositif de présentation d'informations (10) comprenant :

un boîtier allongé (12) comportant deux parois d'extrémité opposées (14, 16) et une première ouverture (18) s'étendant longitudinalement entre lesdites parois d'extrémité, un tambour (32) comportant une surface extérieure (33), ledit tambour s'étendant autour d'un axe longitudinal (34) et étant monté en vue d'une rotation dans ledit boîtier entre lesdites parois d'extrémité (14, 16) de sorte que ledit axé longitudinal est sensiblement parallèle à ladite première ouverture (18) dudit boîtier, et un moyen de fixation (36) destiné à fixer une feuille d'affichage (26) audit tambour (32) de sorte que ladite feuille d'affichage peut être enroulée autour dudit tambour, ledit moyen de fixation (36) comprenant :

une bande de fixation (38) en vue d'une fixation à une première extrémité de ladite feuille d'affichage,

et

un moyen de réception (40) sur ledit tambour destiné à se mettre en prise de façon libérable avec ladite bande de fixation,

ladite bande de fixation (38) et ledit moyen de réception (40) formant un raccordement mécanique libérable,

**caractérisé en ce que** ledit moyen de fixation (36) est configuré de sorte que ledit raccordement mécanique libérable est libérable tandis que ledit tambour (32) se trouve à l'intérieur dudit boîtier allongé (12).

2. Dispositif de présentation d'informations (10) selon la revendication 1, **caractérisé en ce que** le raccordement mécanique libérable est un joint mâle/femelle dans lequel ladite bande de fixation (38) constitue le composant mâle du joint.

3. Dispositif de présentation d'informations (10) selon la revendication 2, **caractérisé en ce que** ledit moyen de réception (40) sur ledit tambour (32) est une fente s'étendant longitudinalement.

4. Dispositif de présentation d'informations (10) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** au moins l'une desdites parois d'extrémité (14, 16) dudit boîtier comporte une ouverture d'insertion (46) s'étendant à partir d'une extrémité de ladite première ouverture (18), ladite ouverture d'insertion étant agencée par rapport audit tambour (32) de sorte que ladite bande de

fixation (38) peut être amenée en prise avec ledit moyen de réception (40) sur ledit tambour en insérant ladite bande de fixation à travers ladite ouverture d'insertion (18) dans une direction sensiblement parallèle audit axe longitudinal (34).

5. Dispositif de présentation d'informations (10) selon la revendication 3, **caractérisé en ce que** ladite surface extérieure (33) dudit tambour comprend une partie en forme d'arc en retrait (84) délimitant au moins partiellement un premier bord (86) de ladite fente s'étendant longitudinalement dans ledit tambour (32), et **en ce que** ladite bande de fixation (38) comporte une partie en forme d'arc (88) qui, lorsque ladite bande de fixation est mise en prise dans ladite fente s'étendant longitudinalement, recouvre ladite partie en forme d'arc en retrait (84).
6. Dispositif de présentation d'informations (10) selon la revendication 5, **caractérisé en ce que** ladite bande de fixation (38) comprend un épaulement s'étendant longitudinalement (90), dans ledit épaulement étant conçu pour venir en butée sur ledit premier bord (86) de ladite fente s'étendant longitudinalement dans ledit tambour (32) lorsque ladite feuille d'affichage (26) est dressée.
7. Dispositif de présentation d'informations (10) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit tambour (32) est sollicité par un ressort de sorte que lorsqu'une feuille d'affichage (26) est fixée audit tambour, ladite feuille d'affichage est attirée dans ledit boîtier (12), ladite sollicitation par ressort étant ajustable au moyen d'un dispositif de mise en tension (52) accessible depuis l'extérieur du boîtier.
8. Dispositif de présentation d'informations (10) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit tambour (32) est muni d'un moyen de positionnement (62), ledit moyen de positionnement étant accessible depuis l'extérieur du boîtier afin d'effectuer un alignement du moyen de réception (40) sur ledit tambour (32) soit avec ladite première ouverture (18) soit avec ladite ouverture d'insertion (46).
9. Dispositif de présentation d'informations (10) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit tambour est muni d'un moyen de blocage (78) accessible depuis l'extérieur du boîtier afin de réaliser un blocage du tambour lorsqu'une feuille d'affichage est déroulée sensiblement complètement dudit tambour (32).
10. Procédé de montage d'une feuille d'affichage (26) sur un dispositif de présentation d'informations (10), ledit dispositif comprenant :

un boîtier allongé (12) comportant deux parois d'extrémité opposées (14, 16) et une première ouverture (18) s'étendant longitudinalement entre lesdites parois d'extrémité, un tambour sollicité par ressort (32) s'étendant autour d'un axe longitudinal (34) et monté en vue d'une rotation dans ledit boîtier entre lesdites parois d'extrémité de sorte que ledit axe longitudinal soit sensiblement parallèle à ladite première ouverture (18) dans ledit boîtier, un moyen de fixation (36) destiné à fixer une feuille d'affichage audit tambour (32) de sorte que ladite feuille d'affichage peut être enroulée autour dudit tambour, ledit moyen de fixation comprenant :

une bande de fixation (38) fixée à une première extrémité de ladite feuille d'affichage, et un moyen de réception (40) sur ledit tambour destiné à se mettre en prise de façon libérable avec ladite bande de fixation,

ledit procédé comprenant les étapes consistant à :

amener ledit moyen de réception (40) sur ledit tambour en alignement avec l'ouverture d'insertion (46) dans l'une desdites parois d'extrémité dudit boîtier, insérer ladite bande de fixation (38) à travers ladite ouverture d'insertion dans une direction sensiblement parallèle audit axe longitudinal (34) de sorte que ladite bande de fixation soit amenée en prise avec ledit moyen de réception (40) sur ledit tambour, enrouler ladite feuille d'affichage autour dudit tambour, et mettre en tension ledit tambour sollicité par ressort (32) de sorte que ledit tambour tend à conserver ladite feuille d'affichage dans ledit boîtier (12).

11. Procédé de montage d'une feuille d'affichage (26) sur un dispositif de présentation d'informations (10), ledit dispositif comprenant :

un boîtier allongé (12) comportant deux parois d'extrémité opposées (14, 16) et une première ouverture (18) s'étendant longitudinalement entre lesdites parois d'extrémité, un tambour sollicité par ressort mis en tension au préalable (32) s'étendant autour d'un axe longitudinal (34) et monté en vue d'une rotation dans ledit boîtier entre lesdites parois d'extrémité de sorte que ledit axe longitudinal soit sensiblement parallèle à ladite première ouverture (18) dans ledit boîtier,

un moyen de fixation (36) destiné à fixer une feuille d'affichage (26) audit tambour (32) de sorte que ladite feuille d'affichage peut être enroulée autour dudit tambour, ledit moyen de fixation comprenant :

une bande de fixation (38) fixée à une première extrémité de ladite feuille d'affichage, et

un moyen de réception (40) sur ledit tambour destiné à se mettre en prise de façon libérable avec ladite bande de fixation, et un moyen de blocage (78) destiné à bloquer ledit tambour sollicité par ressort mis en tension au préalable (32) de sorte que ledit moyen de réception (40) sur ledit tambour (32) soit aligné avec une ouverture d'insertion (46) dans une paroi d'extrémité (14) dudit boîtier,

ledit procédé comprenant les étapes consistant à :

insérer ladite bande de fixation (38) à travers ladite ouverture d'insertion (46) dans une direction sensiblement parallèle audit axe longitudinal (34) de sorte que ladite bande de fixation (38) soit amenée en prise avec ledit moyen de réception (40) sur ledit tambour, et libérer ledit moyen de blocage (78) de sorte que ladite feuille d'affichage soit amenée à être enroulée autour dudit tambour (32) .

12. Procédé de montage d'une feuille d'affichage (26) sur un dispositif de présentation d'informations (10), ledit dispositif comprenant :

un boîtier allongé (12) comportant deux parois d'extrémité opposées (14, 16) et une première ouverture (18) s'étendant longitudinalement entre lesdites parois d'extrémité, un tambour sollicité par ressort (32) s'étendant autour d'un axe longitudinal (34) et monté en vue d'une rotation dans ledit boîtier entre lesdites parois d'extrémité de sorte que ledit axe longitudinal soit sensiblement parallèle à ladite première ouverture (18) dans ledit boîtier, un moyen de fixation (36) destiné à fixer une feuille d'affichage audit tambour (32) de sorte que ladite feuille d'affichage peut être enroulée autour dudit tambour, ledit moyen de fixation comprenant :

une bande de fixation (38) attachée à une première extrémité de ladite feuille d'affichage, et

un moyen de réception (40) sur ledit tambour destiné à se mettre en prise de façon

libérable avec ladite bande de fixation,

ledit procédé comprenant les étapes consistant à :

amener ledit moyen de réception (40) sur ledit tambour en alignement avec ladite première ouverture (18) dans ledit boîtier allongé (12), insérer ladite bande de fixation (38) à travers ladite ouverture allongée dans une direction sensiblement parallèle audit axe longitudinal (34) de sorte que ladite bande de fixation est amenée en prise avec ledit moyen de réception (40) sur ledit tambour, enrouler ladite feuille d'affichage autour dudit tambour, et mettre en tension ledit tambour sollicité par ressort (32) de sorte que ledit tambour tend à conserver ladite feuille d'affichage dans ledit boîtier (12).

13. Procédé de montage d'une feuille d'affichage (26) sur un dispositif de présentation d'informations (10), ledit dispositif comprenant :

un boîtier allongé (12) comportant deux parois d'extrémité opposées (14, 16) et une première ouverture (18) s'étendant longitudinalement entre lesdites parois d'extrémité, un tambour sollicité par ressort mis en tension au préalable (32) s'étendant autour d'un axe longitudinal (34) et monté en vue d'une rotation dans ledit boîtier entre lesdites parois d'extrémité de sorte que ledit axe longitudinal soit sensiblement parallèle à ladite première ouverture (18) dans ledit boîtier, un moyen de fixation (36) destiné à fixer une feuille d'affichage (26) audit tambour (32) de sorte que ladite feuille d'affichage puisse être enroulée autour dudit tambour, ledit moyen de fixation comprenant :

une bande de fixation (38) fixée à une première extrémité de ladite feuille d'affichage, et

un moyen de réception (40) sur ledit tambour destiné à se mettre en prise de façon libérable avec ladite bande de fixation, et

un moyen de blocage (78) destiné à bloquer ledit tambour sollicité par ressort mis en tension au préalable (32) de sorte que ledit moyen de réception (40) sur ledit tambour (32) soit aligné avec ladite première ouverture (18) dans ledit boîtier,

le procédé comprenant les étapes consistant à :

insérer ladite bande de fixation (38) à travers ladite première ouverture (18) dans une direction sensiblement perpendiculaire audit axe longitudinal (34) de sorte que ladite bande de fixation (38) est amenée en prise avec ledit moyen de réception (40) sur ledit tambour, et libérer ledit moyen de blocage (78) de sorte que ladite feuille d'affichage soit amenée à être enroulée autour dudit tambour (32).

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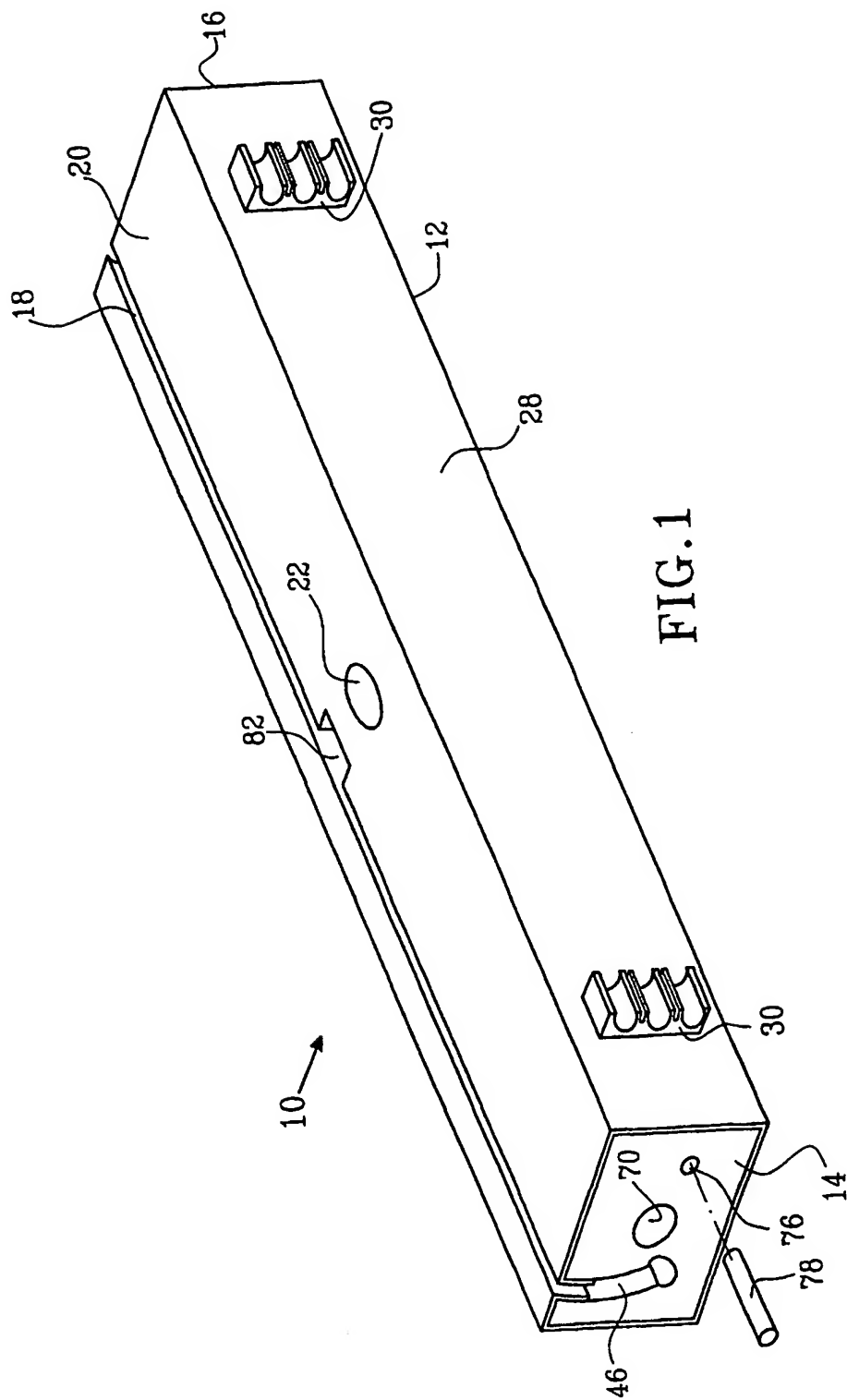
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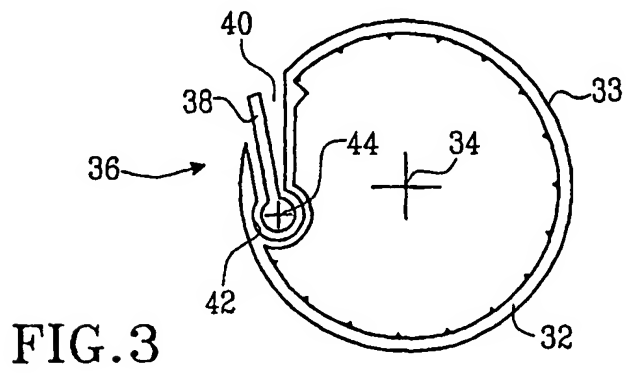
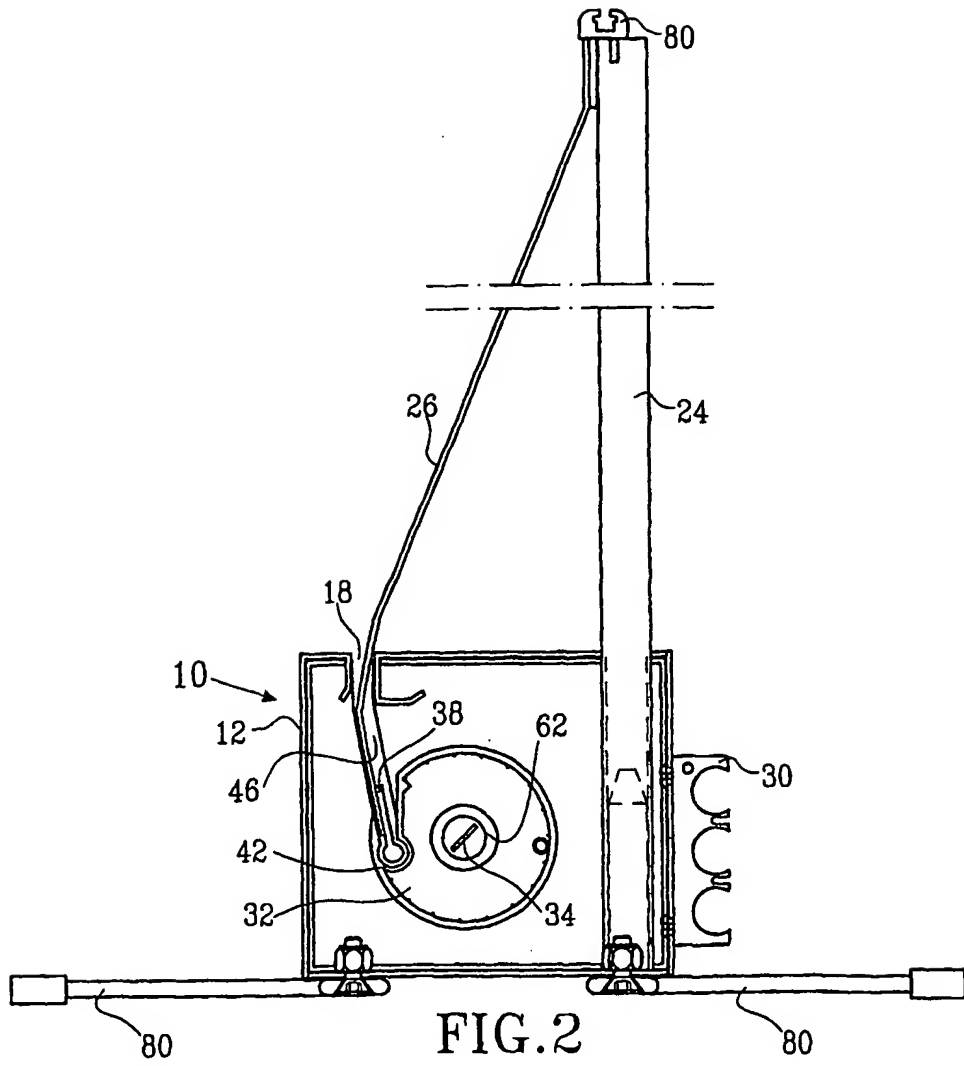
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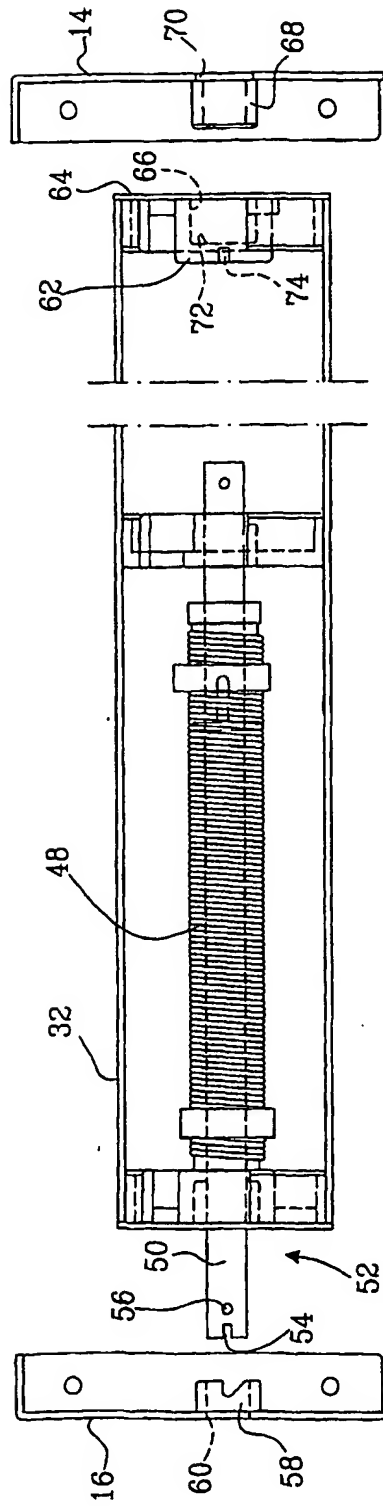


FIG. 4

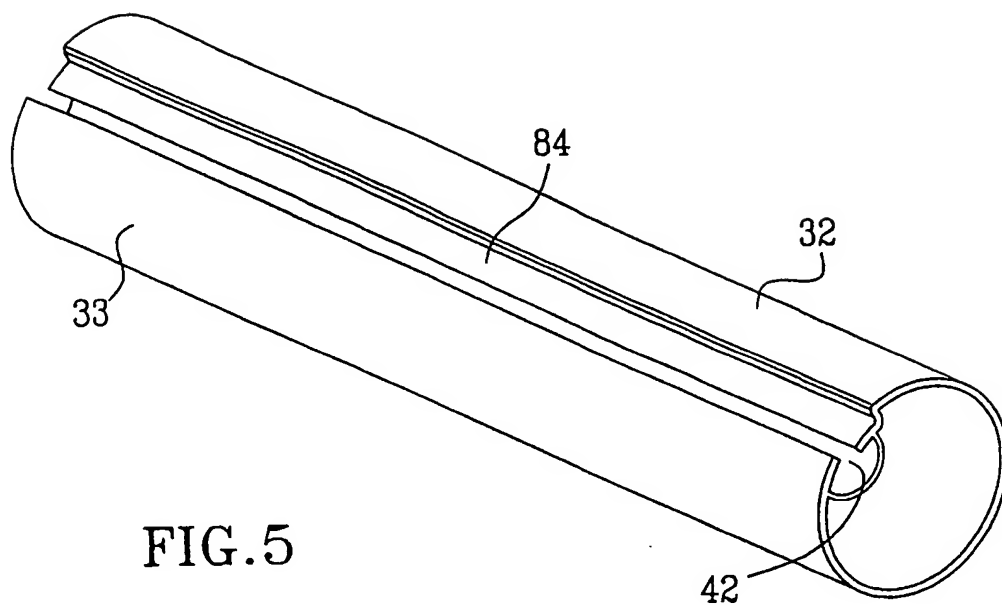


FIG. 5

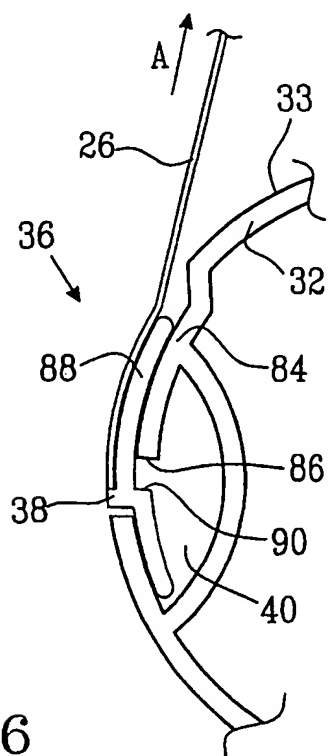


FIG. 6